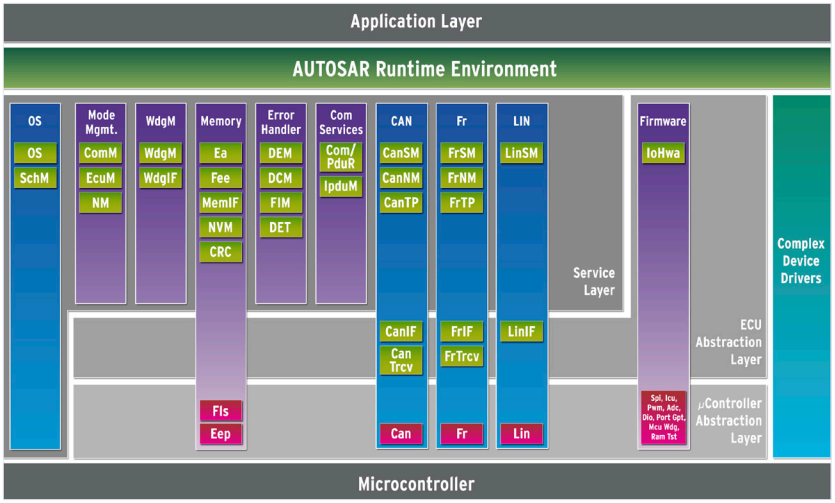
Volcano™ VSTAR AUTOSAR 4.0 Software

Vehicle Systems Design

D A T A S H E E T



The Volcano VSTAR basic software stack provides a fully AUTOSAR 4.0-compliant and scalable middleware for ECU design, which abstracts the application from the hardware-dependent layer. VSTAR is part of the comprehensive Mentor Graphics vehicle systems design toolset, which provides a robust medium for an AUTOSAR-based vehicle system design flow, including E/E architectural design, application software development, virtual validation, and SW test.

FEATURES AND BENEFITS:

- AUTOSAR V4.0 basic software stack
- Usable for body, chassis, and powertrain domains
- Communications stacks for LIN, CAN, and FlexRay
- AUTOSAR operating system supports all classes of scalability
- Profiling opotion for execution of time-critical applications
- Post-build support
- Scalable for small footprints
- Porting available for multtiple automative microcontroller targets and compiler

FULLY COMPLIANT AUTOSAR 4.0 BASIC SOFTWARE FOR ECU DESIGN

The Volcano VSTAR embedded basic software (BSW) stack offers maximum flexibility and ease-of-use for application programmers.

The product consists of 1) an operating system, 2) a runtime environment (RTE) generator, 3) modules for mode management, 4) modules that support AUTOSAR services such as memory, diagnostic, and communication services, and 5) firmware for I/O hardware abstraction.

Integrations and Configuration

Mentor Graphics offers portings to the most popular microcontroller devices and integrations with OEM-specific compatibility modules. VSTAR can be provided for any automotive microcontroller that supports AUTOSAR. Several portings are available off-the-shelf, including those for the Freescale MPC or Renesas V850 families. Compiler portings are also available for the most popular compilers, such as Green Hills, CodeWarrior, etc. Mentor Graphics works closely with microcontroller and compiler vendors to constantly expand the existing portfolio.

Mentor Graphics supports various configuration variants for its basic software, such as link time, post-build loadable, and post-build selectable. Pre-compile configuration parameters can be provided at link time, allowing the user to only deal with pre-compiled libraries instead of source code.

VSTAR software optionally includes complete communication stacks for LIN, CAN, and FlexRay implementations.

Operating System

The Mentor Graphics AUTOSAR operating system is based on the OSEK/VDX standard; it supports all conformance classes and scalability (class 1 to 4). The operating system is part of the AUTOSAR system services and provides

features such as OSEK operating system, counter interface, schedule tables, stack monitoring protection hooks, timing protection, global time/synchronization support, and memory protection.

The operating system is provided in six variants:

1. Scalability Class 1 with standard error reporting
2. Scalability Class 1 with extended error reporting
3. Scalability Class 2 with standard error reporting
4. Scalability Class 2 with extended error reporting
5. Scalability Class 3 with extended error reporting
6. Scalability Class 4 with extended error reporting

For simulation purposes, an AUTOSAR operating system for Windows is available.

The exchange format within this tool chain is standard AUTOSAR .arxml supported by multiple importers for Fibex, ODX, etc. Furthermore, Mentor Graphics delivers a complete make/build system for easy compilation of libraries or the binary image.

Runtime Environment

VSTAR's runtime environment generates well documented and verified glue code (.c and .h files) between the application layer (SW component descriptions and related service needs) and the BSW layer.

The RTE Generator consists of two distinct phases. Both can be run independently from each other.

RTE Contract Phase - In this phase, the AUTOSAR interface definitions are used to create application header file(s) for one or more component type(s), providing consistent use in software development.

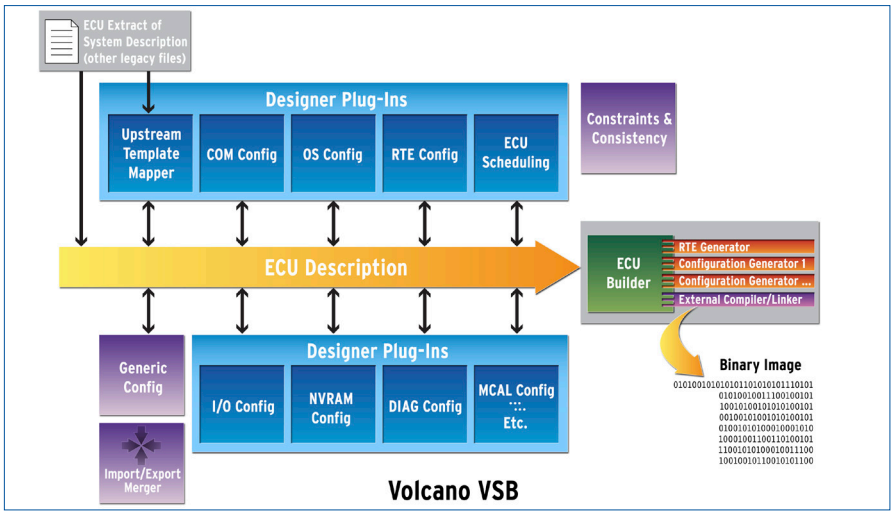
RTE Generation Phase - Here, the complete interface API is generated from information about components, their deployment to ECUs, and communication connections.

Volcano VSx Tool Suite

Mentor Graphics offers a complete integrated tool suite for top-down vehicle system and ECU design. VSTAR is part of the comprehensive Mentor Graphics Volcano VSx AUTOSAR tool chain, which also includes:

- Volcano Vehicle System Architect (VSA) - an architecture design tool
- Volcano VSA COM Designer - a network design tool for AUTOSAR-based ECUs
- Volcano Vehicle System Builder (VSB) - the ECU configuration tool
- Volcano Vehicle Systems Integrator (VSI) - a simulation tool

All VSx tools are built upon the Eclipse framework and thus are part of a modular and open framework for development tools.



The Volcano Vehicle System Builder (VSB), a basic software configuration tool, works in conjunction with VSTAR to configure and buld ECU networks.

For the latest product information, call us or visit: www.mentor.com/vnd

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